Transmission Business Line – Capital

Funding Schedule by Activity

(Accrued Expenditures)

(dollars in thousands)

	FY 2004	FY 2005	FY 2006	$ Change	% Change
Main Grid	154,327	58,855	96,498	+37,643	+64.0%
Area & Customer Services	5,626	10,604	20,049	+9,445	+89.1%
Upgrades & Additions	54,248	45,599	62,761	+17,162	+37.6%
System Replacements	59,614	83,202	87,271	+4,069	+4.9%
Projects Funded in Advance	41,317	153,791	147,359	-6,432	-4.2%
Total, Trans Business Line - Capital	315,132	352,051	413,938	+61,887	+17.6%

Description

The TBL is responsible for about 75 percent of the Pacific Northwest's high-voltage transmission. TBL provides for all additions, upgrades, and replacements to the Federal transmission system, resulting in reliable service to northwest industrial users and utility customers. The transmission system also facilitates the sale and exchange of power to and from the region. TBL offers transmission service under the terms and conditions of its Open Access Transmission Tariff (OATT).

The eastern blackout on August 14, 2003, alerted the Nation to the lack of investment in utility infrastructure. BPA received its alert with the August 10, 1996, West Coast disturbance that originated in the Northwest. Infrastructure investment is being made and operational practices were changed to strengthen the system. The West Coast energy crisis of 2000-2001 was a second red flag that triggered the need for the BPA transmission infrastructure program to shore up the grid.

TBL is continuing to make significant infrastructure improvements and additions to the system over the next several years to assure open and non-discriminatory access as guided by FERC. These improvements and additions will help the Federal transmission system continue to comply with national reliability standards, replace aging equipment, allow for interconnection of needed new generation, and remove constraints that limit economic trade or the ability to maintain the system. Prior to beginning the infrastructure improvements, the TBL had built no major transmission projects since 1987. Only incremental additions had been added to the system over the years.

The system continues to show signs of stress, as two close calls in 2003 demonstrated. On June 4, 2003, voltage instability in the Spokane area was prevented by quick operator action. Two weeks later the transmission path between Montana and Idaho was overloaded for two days, and operator adjustments prevented load loss.

In addition, about 15,000 megawatts of generation are under consideration for siting in the Northwest. The Transmission System will become even more stressed as generation is added if nothing is done to reinforce the existing network.

Bonneville's infrastructure investments to strengthen the network consist of the following projects:

(G1) Puget Sound Area Additions (Complete), (G2) North of Hanford/North of John Day (under construction), (G3) West of McNary (pending generation interconnection decisions), (G4) Starbuck Generation (cancelled), (G5) Lower Monumental and McNary Area Generation (Phase II) (cancelled), (G6) Cross Cascades North (Complete), (G7) Celilo Modernization (completed), (G8) I-5 Corridor Additions (on hold), (G9) Spokane Area and Western Montana Generation Additions (under construction), (G10) Portland Area Additions (Complete), (G12) Olympic Peninsula Additions (under further study), (G13) I-5 Corridor Generation Additions (Southwest Washington-Northwest Oregon) (on hold pending generation interconnection decisions). These projects are further described below.

These projects will relieve congestion contributing toward restoring an adequate reliability margin back into the grid. This additional margin will be used to respond to a competitive market, meet regional load during outages, move power to meet changing loads, perform maintenance without harming the market, and allow the Grid West (formally referred to as RTO West) to start without the regional grid being heavily congested.

Bonneville assumes that some generators will integrate their power into the Federal transmission system. Depending on which generators build on sites in the Northwest and the project locations, significant generation capacity can be integrated with the completion of those generator integration projects listed above. Bonneville assumes that the additions and improvements necessary for generation integration will be funded by generators. BPA assumes that it will amortize the upfront payments through credits for transmission services, as FERC has encouraged.

As a means to further sustain BPA's limited Treasury financing, third-party funding partnerships also are being pursued for some projects . For example, on projects associated with generation integration, the potential generation or transmission customers are being consulted regarding funding the construction of these projects. The Schultz-Wautoma (part of G2) 500-kV project is being funded through third party financing, and non-Federal funding for the McNary-John Day (part of G3) 500-kV transmission project is being pursued as well.

The system replacement plan is to replace high-risk, obsolete, and maintenance-intensive facilities and equipment and to reduce the chance of equipment failure by: 1) replacing high voltage transformers and power circuit breakers that are at or near the end of their useful life; 2) replacing risky, outdated, and obsolete control and communications equipment and systems; and 3) replacing all other existing high-risk equipment and facilities affecting the safety and reliability of the transmission system.

Bonneville will continue to fund fiber optic communications facilities needed to meet Bonneville's projected operational needs. To the extent that these investments create temporary excess fiber optic capacity, such capacity can be made available to telecommunications providers and to regional non-profits to meet public benefit needs. Bonneville's investments in fiber optics are consistent with the "Fiber Optic Cable Plan" submitted to Congress on May 24, 2000, accompanying the FY 2000 Energy and Water Development Appropriations Act.

Detailed Justification

	(dollars in thousands)		
	FY 2004	FY 2005	FY 2006
Main Grid	**154,327**	**58,855**	**96,498**

Bonneville's strategic objectives for Main Grid projects are to provide voltage support; provide a reliable transmission system for open access per FERC criteria; provide for relief of transmission system congestion; and to assure compliance with the Nuclear Energy Regulatory Commission (NERC), Western Electric Coordinating Council (WECC) and BPA reliability standards. During this budgeting period, projects are planned that will provide voltage support to major load areas that are primarily west of the Cascade mountains, and will provide for transmission access for new generation projects to the load center. Minor reinforcements in the Portland, Oregon/Seattle, Washington corridor are also planned.

- FY 2004: 1) Completed construction of the Kangley-Echo Lake 500-kV line and substation addition at Echo Lake, and the 500/230-kV transformer bank addition at SnoKing Substation (G1- Puget Sound Area Additions); 2) Continued Wautoma Substation construction (G2- North of Hanford/North of John Day); 3) Completed installation of the 500-kV series capacitor addition at Schultz substation (G6 -Cross Cascades North); 4) Continued construction of the Grand Coulee-Bell 500-kV line and substation additions including 500-kV series capacitor additions at Bell and Dworshak substation, 500-kV series capacitor and controls replacement at Garrison Substation (G9- Spokane Area and Western Montana Generation Additions); 5) Continued construction of the 500-kV shunt reactor addition at Grand Coulee; 6) Completed the installation of the 500/230-kV transformer bank addition at Pearl Substation (G10- Portland Area Additions); 7) Continued the Ostrander 500-kV shunt capacitor group addition; 8) Began environmental analysis, demand side management study, design and material acquisition for Olympic Peninsula Addition II (G12); 9) Delayed the loop in of the Wautoma-Ostrander 500-kV line to Big Eddy Substation (G14) to FY 2012; 10) Delayed the Libby-Sand Spring-Bell 230-kV project (G15 & G20) to FY 2012); 11) Placed the Monroe-Echo Lake 500-kV line #2 (G8- I-5 Corridor Additions) on hold; 12) Completed tower footings and mitigation for tower crossing at McNary for the G-3 West of McNary; 13) Continued planning studies and design to comply with the N-2 outage reliability criteria; 14) Continued planning studies to identify other system reactive needs to mitigate unacceptable low or high voltage problems and other system additions;

(dollars in thousands)		
FY 2004	FY 2005	FY 2006

15) Continued planning studies to solve the transmission system capacity congestion and for the integration of new generation facilities; 16) Continued planning studies to identify and clarify needed infrastructure additions.

- FY 2005: (1) Continue construction of the Schultz-Wautoma 500-kV line and Wautoma Substation (G2- North of Hanford/North of John Day); 2) Complete construction of Grand Coulee-Bell 500-kV line (G9); 3) Continue planning studies for the Olympic Peninsula Addition II project (G12); 4) Review and keep current studies for the Southwest Washington-Northwest Oregon generation integration project (G13) (on hold); 5) Continue studies for the loop in of the Wautoma-Ostrander 500-kV line to Big Eddy Substation (G14); 6) Continue planning studies for the Monroe-Echo Lake 500-kV line #2 (G8) (I-5 Corridor Additions); 7) Design will be completed, materials ordered, and construction started on the West of McNary (G-3), pending generation interconnection decisions; (G4) Starbuck Generation (cancelled), (G5) Lower Monumental and McNary Area Generation (Phase II) projects; 8) Continue planning studies and design to comply with the N-2 outage criteria; 9) Continue planning studies to identify other system reactive needs to mitigate unacceptable low or high voltage problems and other system additions; 10) Continue planning studies to solve the transmission system capacity congestion and for the integration of new generation facilities; 11) Continue planning studies to identify and clarify needed infrastructure additions.

- FY 2006: 1) Complete construction of the Schultz-Wautoma 500-kV line and Wautoma Substation (G2- North of Hanford/North of John Day); 2) Complete construction of West of McNary (G-3), pending generation interconnection decisions; 3) Continue planning studies to identify and clarify needed infrastructure additions; 4) Continue planning studies and design to comply with the N-2 outage criteria; 5) Continue planning studies to identify other system reactive needs to mitigate unacceptable low or high voltage problems and other system additions; 6) Continue planning studies to solve the transmission system capacity congestion and for the integration of new generation facilities.

Area & Customer Service **5,626** **10,604** **20,049**

Bonneville's strategic objective for Area and Customer Service projects is to assure that Bonneville meets the reliability standards and the contractual obligations we have to our customers for serving load.

- FY 2004: 1) Completed construction to rebuild the Albany-Eugene 115-kV line to double circuit from Eugene to the Alderwood Tap; 2) Completed the rebuild of Minidoka Substation; 3) Cancelled adding 115-kV line sectionalizing switches at Victor Tap; 4) Retired low voltage facilities at Addy Substation; 5) Replaced the 115-12.5-kV transformer at Duckabush Substation; 6) Completed conversion of 69 to 115-kV facilities at Port

(dollars in thousands)

Angeles and Fairmount substations; 7) Delayed adding 230-kV and 115-kV terminal facilities at Vintage Valley Substation to FY 2007; 8) Continued preliminary engineering and design for miscellaneous facilities required to meet contractual obligations and maintain reliable service for BPA's service area.

- FY 2005: 1) Add 115k-V switches at Olympia Substation; 2) Add a 115-kV terminal at McNary Substation; 3) Relocate approximately 1 mile of the White Bluffs-Richland 115-kV line; 4) Add a 115-kV circuit breaker at Targee substation; 5) Begin work on a new Caribou substation to support Lower Valley Power & Light; 6) Continue preliminary engineering and design for miscellaneous facilities required to meet contractual obligations and maintain reliable service for BPA's service area.

- FY 2006: 1) Begin studies for SW Oregon Coast (Bandon-Rogue); 2) Begin studies for East Omak 230/115-kV transformer; 3) Continue work on new Caribou Substation; 4) Replace Hampton transformer; 5) Add two 115-kV breakers at Red Mountain Substation; 6) Add shunt caps for Fords Prairie area; 7) Add SVC for Condon wind generation; 8) Reconductor Chehalis-Centralia 69-kV #1 & #1 lines; 9) Continue preliminary engineering and design for miscellaneous facilities required to meet contractual obligations and maintain reliable service for BPA's service area.

Upgrades & Additions	**54,248**	**45,599**	**62,761**

Bonneville's strategic objectives for Upgrades and Additions are to replace older communications and controls with newer technology, including fiber optics, in order to maintain or enhance the capabilities of the transmission system; to implement special remedial action control schemes to accommodate new generation and mitigate immediate operational and market constrained paths; and to support communications and remedial action schemes, and other associated activities. During this budget period, BPA will complete design, material acquisition, construction, and activation of several fiber optics facilities to provide bandwidth capacity and high-speed data transfers to eventually replace microwave analog radios that are technologically obsolete and nearing the end of their useful life. In some areas, temporarily excess fiber capacity is being offered for a term to telecommunications providers or to non-profit entities as a public benefit.

- FY 2004: 1) Completed construction of the 12 mile fiber optic cable on the Raver-Echo Lake 500-kV line; 2) Completed construction of the Kalispell-Hot Springs digital radio section of the Noxon-Hot Springs 200-mile fiber optic project; 3) Continued construction of the Thompson Falls to Taft sections of the 175-mile Noxon-Hatwai fiber optic project; 4) Continued construction of 41 miles of fiber optic cable and terminations from Echo lake to Monroe to Snohomish; 5) Delayed the design, material acquisition construction of 32 miles

of fiber optic cable between Covington, Maple Valley, and Echo Lake; 6) Continued construction of fiber projects and digital radio system upgrades to improve the operational telecommunication system; 7) Continued replacement and upgrade of operational and business tools at the Dittmer and Munro control centers; 8) Continued planning, design, material acquisition, and construction of special remedial action control schemes required for interconnecting new generation projects and mitigating immediate constrained paths; 9) Continued planning, design, material acquisition, and construction of various system additions and upgrades necessary to maintain a reliable system for BPA's service area.

- FY 2005: 1) Complete the Thompson Falls to Taft sections of the 175-mile Noxon-Hatwai fiber optic project; 2) Complete construction of the 41-mile fiber optic Echo Lake-Monroe-Snohomish project; 3) Begin the design, material acquisition and start construction of the 32-mile Covington-Maple Valley-Echo Lake fiber optic project; 4) Begin the design, material acquisition for the 45-mile Pearl-Troutdale fiber optic project; 5) Continue construction of fiber related projects and digital radio system upgrades to improve the operational telecommunication system; 6) Continue replacement and upgrade of operational and marketing business tools at the Dittmer and Munro control centers; 7) Continue planning, design, material acquisition, and construction of special remedial action control schemes required for interconnecting new generation projects and mitigating immediate constrained paths; 8) Continue planning, design, material acquisition, and construction of various system additions and upgrades necessary to maintain a reliable system for BPA's service area.

  FY 2006: 1) Complete construction of the 32-mile Covington-Maple Valley-Echo Lake fiber optic project; 2) Start construction of the 45-mile Pearl-Troutdale fiber optic project; 3) Begin design and material acquisition for the 40-mile Pearl-Marion fiber optic project (pending the start of the Sempra generation project); 4) Begin design and material acquisition for the 68-mile Snohomish-Bellingham fiber optic project; 5) Continue construction of fiber related projects and digital radio system upgrades to improve the operational telecommunication system; 6) Continue replacement and upgrade of operational and marketing business tools at the Dittmer and Munro control centers; 7) Continue planning, design, material acquisition, and construction of special remedial action control schemes required for interconnecting new generation projects and mitigating immediate constrained paths; 8) Continue planning, design, material acquisition, and construction of various system additions and upgrades necessary to maintain a reliable system for BPA's service area.

	(dollars in thousands)		
	FY 2004	FY 2005	FY 2006
System Replacements	**59,614**	**83,202**	**87,271**

Bonneville's strategic objectives for System Replacement are to replace high-risk, obsolete, and maintenance-intensive facilities and equipment and to reduce the chance of equipment failure by: 1) replacing high-voltage transformers and power circuit breakers which are at or near the end of their useful life; 2) replacing risky, outdated, and obsolete control and communications equipment and systems; and 3) replacing all other existing high-risk equipment and facilities affecting the safety and reliability of the transmission system.

Non-Electric Replacements:

- FY 2004: 1) Completed various maintenance building and control house roof replacements; 2) Completed seismic upgrades to buildings; 3) Completed various HVAC (high-voltage alternating current) replacements; 4) Completed other non-electric replacements as necessary; 5) Continued the design, material acquisition, and construction for the Access Road Program; 6) Preliminary design activities for potential Dittmer Control Center expansion initiated.

- FY 2005: 1) Complete various maintenance building and control house roof replacements; 2) Complete seismic upgrades to buildings; 3) Complete various HVAC replacements; 4) Complete other non-electric replacements as necessary; 5) Continue the design, material acquisition, and construction for the Access Road Program.

- FY 2006: 1) Complete various maintenance building and control house roof replacements; 2) Complete seismic upgrades to buildings; 3) Complete various HVAC replacements; 4) Complete other non-electric replacements as necessary; 5) Continue the design, material acquisition, and construction for the Access Road Program.

Electric Replacements:

- FY 2004: 1) Completed replacement of aged AC-DC converter valves and control systems at the Celilo Converter Station necessary to continue operation of 3100 MW of DC transmission capability (G7); 2) Completed the reconductor of approximately 22 miles of the John Day-Big Eddy 500-kV line; 3) Completed replacement of PCB-contaminated capacitors at various locations; 4) Completed replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using RCR criteria. Such replacements include relays, annunciators, oscillographs, various types of communication related equipment, and SCADA equipment; 5) Completed replacement of under-rated and high-maintenance substation equipment; 6) Continued replacing spacer dampers on various 500-kV lines; 7) Completed replacement of certain critical, operational

tools and marketing business systems at the Dittmer and Munro Control Centers; 8) Continued replacing deteriorating wood pole transmission line structures.

- FY 2005: 1) Replace system protection and control equipment and other substation and line facilities as needed to maintain reliability using RCR criteria. Such replacements include relays, annunciators, oscillographs, various types of communication related equipment, and SCADA equipment; 2) Replace under-rated and high-maintenance substation equipment; 3) Replace spacer dampers on various 500-kV lines; 4) Replace critical, operational tools and marketing business systems at the Dittmer and Munro Control Centers; 5) Replace deteriorating wood pole transmission line structures.
- FY 2006: 1) Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using RCR criteria. Such replacements include relays, annunciators, oscillographs, various types of communication related equipment, and SCADA equipment; 2) Continue replacement of under-rated and high-maintenance substation equipment; 3) Continue replacing spacer dampers on various 500-kV lines; 4) Continue replacing critical, operational tools and marketing business systems at the Dittmer and Munro Control Centers; 5) Continue replacing deteriorating wood pole transmission line structures.

Projects Funded in Advance **41,317** **153,791** **147,359**

This category includes those facilities and/or equipment where BPA retains ownership but which are funded by a third party, either in total or in part.

- FY 2004: 1) Continued study work to integrate new 1,300 MW generation capacity near Wallula into the BPA transmission grid per Transmission Service Request via the OATT (G5) (cancelled); 2) Placed on hold the design, material acquisition, and construction of the Southwest Washington-Northwest Oregon 500-kV line addition (G13); 3) Continued studies for the integration of new 290 MW generation capacity near Longview into the BPA transmission grid per Transmission Service Request via the OATT; 4) Started planning to integrate new 1,300 MW generation capacity near West of McNary pending generator interconnection decisions; 5) Continued to integrate various new wind generation projects into BPA transmission grid per Transmission Service Request via the OATT; 6) Started construction of the Schultz-Wautoma (G-2) 500-kV transmission line; 7) Performed studies to identify system impacts and needs regarding proposed new generation projects; 8) Performed environmental cleanup and other work necessary for the sale of BPA facilities; 9) Completed other projects as requested by customers.

- FY 2005: 1) Continue work to integrate new 1,300 MW generation capacity near Wallula into the BPA transmission grid per Transmission Service Request via the OATT (G5)

(dollars in thousands)		
FY 2004	FY 2005	FY 2006

(cancelled); 2) Continue hold on the design, material acquisition, and construction of the Southwest Washington-Northwest Oregon 500-kV line addition (G13); 3) Complete design, order materials, start construction on the West of McNary (G3), pending generator interconnection decisions; 4) Continue to integrate various new wind generation projects into BPA transmission grid per Transmission Service Request via the OATT; 5) Continue construction of the Schultz-Wautoma (G-2) 500-kV transmission line; 6) Perform studies to identify system impacts and needs regarding proposed new generation projects; 7) Perform environmental cleanup and other work necessary for the sale of BPA facilities; 8) Complete other projects as requested by customers; 9) Complete engineering estimates and timelines for 37 microwave paths in the 1710-1755 Mhz frequency band to facilitate a frequency spectrum auction related to P.L. 108-494, the Commercial Spectrum Enhancement Act, signed on December 23, 2004. The costs to perform the engineering studies, as well as relocation costs, will be fully compensated by funds from the auction, expected to be held as early as June 2006.

- FY 2006: 1) Complete work to integrate new 1,300 MW generation capacity near Wallula into the BPA transmission grid per Transmission Service Request via the OATT (G5) (cancelled); 2) Resume design, material acquisition, and construction of the Southwest Washington-Northwest Oregon 500-kV line addition (G13); 3) Complete design, order materials, start construction on the West of McNary (G3), pending generator interconnection decisions; 4) Continue to integrate various new wind generation projects into BPA transmission grid per Transmission Service Request via the OATT; 5) Complete construction of the Schultz-Wautoma 500-kV transmission line; 6)Perform studies to identify system impacts and needs regarding proposed new generation projects; 7) Perform environmental cleanup and other work necessary for the sale of BPA facilities; 8) Complete other projects as requested by customers.

Total Transmission Business Line – Capital	**315,132**	**352,051**	**413,938**

Explanation of Funding Changes

	FY 2006 vs. FY 2005 ($000)
Main Grid	
▪ Reflects fiscal year shifts in material and construction costs associated with the infrastructure projects and to accommodate projects associated with updated power flow study results	+37,643
Area & Customer Services	
▪ Reflects greater emphasis on customer service projects.	+9,445

Upgrades & Additions

- Reflects increased emphasis on both systemwide communications upgrades and improvements and additions to other transmission facilities . . . . . +17,162

System Replacements

- Reflects greater emphasis on system replacements . . . . . +4,069

Projects Funded in Advance

- Reflects less emphasis on completion of large customer funded or third party funded projects related to generation integration . . . . . -6,432

Total Funding Change, Transmission Business Line - Capital . . . . . +61,887